**Tenneco Minerals**
A Tenneco Company

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April 6, 1991



Lowell P. Braxton
Associate Director, Mining
Division of Oil, Gas and Mining
3 Triad Center, Suite 350
Salt Lake City, Utah 84180

Dear Lowell:

RE: Response to Conditional Approval, Permit Amendment, Covington Pit & Haul Road Development, Goldstrike Mine, M/053/005, Washington County, Utah

Tenneco has reviewed your letter dated March 9, 1992 concerning our permit amendment for the Goldstrike Mine. The necessary changes have been made to the text and maps; some comments require discussion only, and in those cases, no text changes were made. Transmitted with this letter are replacement pages and drawings for the NOI. Feel free to contact me if we can provide additional information.

**R647-4-105.3 Maps and Drawings**

1. New Figures 4.9-2, 4.9-3 and 4.9-4 have been provided to show additional details of low flow crossings. These drawings along with changes to text in Section 4.9 should allow further technical review of the crossings. Fill volumes for each crossing are shown on the figures.

2.a. The EXPLANATION portion of Drawings GS-018 and GS-019 has been revised to reference additional detail drawings.

b. The estimated upstream and downstream extent of fill to be placed in the low flow crossings has been indicated on Drawing GS-019.

c. Direction flow arrows have been placed below each culvert and low flow crossing on Drawings GS-018 and GS-019.

d. Silt fence locations have been added to Drawings GS-018 and GS-019.

e. Road drainage ditch and flow direction have been added to Drawings GS-018 and GS-019 as requested.

f. Named drainages (East Fork Beaver Dam Wash, Jackson Gulch, Arsenic Gulch, Pegleg Gulch and Quail Canyon) have been labeled on Drawings GS-018 through GS-020.

g. The contributing area above the highwall of East-2 Arsenic pit is very small (0.8 acres). The total runoff that would enter the pit from this area during the 100-year, 24-hour precipitation event would be 0.06 acre-feet. No diversion of this small volume of runoff would be necessary.

Access to the East-2 Arsenic pit will be accomplished by minor upgrade of an existing exploration road. No fill has or will be placed in the drainage crossing. Sediment transported downstream of the road and pit disturbance will be controlled with a silt fence as shown on Drawing GS-019.

h. Drawing GS-019 has been revised to show the channel and flow direction for runoff that will be conveyed around the West Arsenic pit. This channel will be left in place after reclamation so that upstream runoff will not enter the partially backfilled pit. Therefore the channel has been designed to convey the peak flow of 117 cfs resulting from the 100-year, 24-hour precipitation event. During the short operational period, any runoff would cross the road leading into the pit as no fill will be placed at this location. After reclamation, the channel dimensions will be continued in this short reach as well.

3. The two map sets were done separately to provide clarity; combination of the two sets into one would result in difficulties in reading the maps.

**R647-4-107.2&3 Operational Practices (Drainage and Erosion Control)**

1.a. As new Figures 4.9-2 through 4.9-4 and the revised section 4.9 show, low flow crossings are planned for 6 of the crossings where peak flow from the 100-year, 24-hour runoff event has been calculated to be less than 100 cfs. These crossings will function as follows:

Flow from the upstream, natural channel (approximate 2-foot bottom width, n=.03, flow supercritical) will enter the placed fill at relatively high velocity. The placed fill is approximated by a triangular channel, side slopes 1:20, with n=.024. Grade will be 0.5 percent with flow in this reach subcritical, therefore an hydraulic jump will occur near the transition. Jump height is less than 0.5 feet in all crossings, so wave height will be minimal. A conservative design for energy dissipation at this transition places riprap along the first 20 feet of fill. This will allow for variation in location and length of jump. As flow spills over the roadway surface to the 3:1 roadfill outslope, flow passes critical depth and again become supercritical. The configuration of the riprap channel and size of riprap varies with each crossing and is contained in the text. The riprapped channel will be keyed in at the crest of the slope, and filter fabric will be used to provide additional protection against failure of the fill. As the

fill slope toes out into the natural channel, flows remain supercritical with velocities decreasing somewhat. Again, a conservative design for energy dissipation continues riprap into the natural channel for a distance of 20 feet.

b. Culverts will be placed in the haul road crossings at 1T, 2B, 4A and 5A. These culverts will be round cmp. They have been designed to pass the peak flow from the 10-year, 24-hour storm. Standard culvert nomographs were used to size culverts. Headwater/diameter ratios were kept at less than 1.2 to be conservative; inlet control was assumed for all conditions because of steepness of drainages and low potential for backwater conditions. Section 4.9 in the NOI have been revised to provide information on these culverts. As the new Table 4.9-3 shows, drainage crossing 1T will require one 72-inch diameter culvert placed in line with the direction of flow in the Arsenic Gulch channel. A 36-inch round culvert will be placed in drainage crossing 2B.

As Section 6.5 indicates, culverts will be removed upon reclamation as the road is regraded. Channels will be reestablished to meet capacity and grade of the upstream and downstream undisturbed channel reaches.

2. The channel immediately above and leading into crossing at 1T represents a short realignment of the main Arsenic Gulch channel. The existing, natural reach will be encroached upon by the haul road fill. This channel has been sized to pass the peak from the 10-year, 24-hour precipitation event and will be trapezoidal, with a 25-foot bottom width and 2.5:1 sideslopes. Riprap with a d50 of 1 foot will be used to line the channel. Section 4.9 of the NOI has been revised to provide information on the channel. Upon reclamation and removal of haul road fill, the natural channel will be reestablished by matching the grade and capacity of the upstream and downstream undisturbed reaches.

3. The bottom of the low flow channel crossings that represent the area where flow will be concentrated will not be topsoiled. However, the majority of the crossing will be above water elevations during the design events and topsoiling/revegetation of these areas will not present an erosion hazard.

4. Silt fences will only be placed in smaller ephemeral drainages, not directly in larger channel, as shown on revised Drawings GS-018 and GS-019. In addition, within the larger drainage areas, silt fences will be placed directly downstream of major disturbances, but out of the main channel. They will also be placed at the outlet of selected road drainage ditches before flow mixes with large, undisturbed area runoff and enters culverts. The drawings have been revised to show these silt fences location as well.

Accumulated material behind silt fences will be removed when storage is reduced to 1/3 of the storage capacity as indicated by visual inspection of fence during routine monitoring.

5. Both during operations and upon reclamation, a diversion channel will divert a part of the runoff from above the Covington pit eastward. The drainage boundary on Drawing GS-019 between areas 3A and 3B has been revised to show this change, and the diversion has been drawn as well. Peak flows to these basins have been revised and section 4.9 has been updated to reflect these changes. As the text describes, the diversion ditch will be an earthen, triangular ditch with 2h:1v sideslopes at a grade of 0.5 percent.

6. As the revised Drawing GS-019 shows, the culvert at 1T will be placed at an angle oblique to the road, but generally parallel to the upstream and downstream channel sections.

7. The references in the text to drainage basins 1T and 1U are correct. The errors on Drawing GS-019 that labeled these drainages as 1F and 1G have been corrected.

**R647-4-110.2 Roads, Highwalls, Slopes, etc.**

Upon reclamation approximately 6,000 linear feet of the haul road would be regraded to approximate original contours as shown on Drawings GS-021 and GS-022. Where culverts have been installed in the large drainages, the fill material and culverts would be removed. This would restore the drainages to approximate original contours and would prohibit vehicular access by recreationists. All portions of the haul roads, whether regraded or not, would be topsoiled and revegetated during reclamation.

**R647-4-110.5 Revegetation Planting Program and Topsoil Distribution**

The reclamation seed mixture on Table 6.10-1 has been revised.

If the furrows created by the drill seeder do not provide adequate erosion control on the 2.5:1 slopes, Tenneco would commit to alternative techniques for erosion control.

**R647-4-111.1.15 Reclamation Practices, Berms, Fences, Barriers**

Section 6.4 of the NOI has been revised to remove mention on the berms around the highwalls of the pits.

**R647-4-111.2 Reclamation Practices, Natural Stream Channels**

The reclamation plan and surety have been revised to reflect the costs of removing the material from Drainages 1T, 2B, 4A, and 5A and restoring them to approximate original contours.

**R647-4-111.3 Erosion/Sediment Control**

Upon reclamation, runoff in pit areas will continue as described above and in revised section 4.9. Low flow crossings will continue to function as described during operational conditions. Regrading of the remaining road areas will be done so as not to interfere with the crossings. As the January 22, 1992 version of the NOI indicated in section 6.5, culverts will be removed and waterbars will be spaced as necessary depending upon final grades. The majority of the silt fences installed during operations will remain until the three year monitoring period is complete.

**R647-4-112 Variance**

During reclamation, material from Leach Pad # 3 would be regraded so as to fill in the area upstream of the sediment dam and make it a non-impounding structure. This is stated in Section 6.4 and 6.5, and costs have been included in the surety estimate as stated in Table 8.2-1 of the NOI.

**R647-4-113 Surety**

Tenneco has revised the estimate of the surety to $1,962,400 to reflect the new disturbances associated with this amendment. This is below the bond amount of $2,000,000 that has been posted and therefore, no new bond is proposed.

If you have any questions regarding these responses or changes to the NOI, feel free to contact me.

Sincerely,

Ken A. Kluksdahl by

Ken A. Kluksdahl
Mine Manager

Enclosures

cc: Debra Brannum - Tenneco
Elliott Lips - JBR Consultants Group